

Exponent Laws

i) Product Rule

$$3^4 3^7 = 3^{4+7} = 3^{11}$$

ii) Quotient Rule

$$\frac{3^7}{3^4} = 3^{7-4} = 3^3$$

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Zero Exponent

$$3. \quad \frac{3^3}{3^3} = 3^{3-3} = 3^0 = \boxed{1}$$

$$5^0 = 1 \quad (-2)^0 = 1 \quad \left(\frac{1}{3}\right)^0 = 1$$

$$-7^0 = -\frac{7}{7} = -1$$

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4) Negative Exponents

$$\frac{4^3}{4^6} = 4^{3-6} = \frac{4^{-3}}{1} = \frac{1}{4^3}$$

$$\frac{\cancel{4} \times \cancel{4} \times \cancel{4}}{4 \times 4 \times 4 \times 4 \times 4 \times 4} = \frac{1}{4^3}$$

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5. Power to a Power Rule

$$(3^4)^3 \Rightarrow 3^{4 \times 3} = 3^{12}$$

Power of a Product Rule

$$6.) \quad (x^3 y)^3 = x^3 y^3$$

$$(3x^2)^3 \Rightarrow 27x^6$$

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7. Power of a Quotient Rule

$$\left(\frac{x}{y}\right)^9 = \frac{x^9}{y^9}$$

$$\left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9}$$

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Exponent Laws Recap

$$(-4)^0 = 1$$

$$-4^0 = -1$$

$$(3^2)^3 = 3^{2 \times 3} = 3^6$$

$$2^3 \cdot 2^4 = 2^{3+4} = 2^7$$

$$\left(\frac{4}{7}\right)^{-2} \Rightarrow \left(\frac{7}{4}\right)^2 = \frac{7^2}{4^2} = \frac{49}{16}$$

$$2^{-3} \cdot 4^{-2}$$

$$= 2^{-3} \cdot (2^2)^{-2}$$

$$= 2^{-3} \cdot 2^{-4}$$

$$= 2^{-3+(-4)}$$

$$= 2^{-7}$$

$$= \frac{1}{2^7}$$

$$\left(\frac{4}{3}\right)^{-2} \Rightarrow \frac{4^2}{3^2}$$

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p. 399-401 q. 1- 12, 14, 16 & 17
p.407- 409 q. 1-14

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